



AMIE

FUNDAMENTALS OF DESIGN AND MANUFACTURING



ENGINEERING STUDY GROUP | S.C.O-61, SEC-40 C,CHD,
9855224442,9855234442

(Group A)

Engineering design process and its structure. Identification and analysis of need, product design specifications, standards of performance and constraints.

Searching for design concepts: Morphological analysis, brainstorming. Evaluation of design concepts for physical reliability, economics, feasibility and utility.

Detailed design: Design for manufacture, assembly, shipping, maintenance, use, and recyclability.

Design checks for clarity: Simplicity, modularity and safety. Standardization and size ranges. Reliability and robust design. Design organization and communication: technical reports, drawings, presentations and models.

Concept of manufacturing: Classification of manufacturing processes. Fundamentals of casting. Basic understanding of commonly used casting processes (sand casting, investment casting and permanent mould casting processes).

Fundamentals of metal forming: Hot and cold working; basic understanding of primary metal forming processes (rolling, forging, extrusion, metal forming processes, punching and blanking).

(Group B)

Fundamentals of metal cutting: Tool-work interaction for production of machined surfaces. Classification of machining processes. Basic machining operations (turning, shaping, planing, drilling and milling processes).

Fundamentals of grinding and finishing: Overview of unconventional machining processes; fundamentals of welding processes; introduction to primary welding and allied processes; selection of manufacturing processes. Design for manufacturability.

Need for integration: Commercial, economic and technological perspective; basic tools of integration; concept of a system. Introduction to information technology and its elements.

Introduction to group technology: Introduction to simulation and database management system.

Elements of integration: Controllers, sensors, robots, automated machines; AGVs, AS, RS, etc.

Product and process design for integration: Design for economic manufacturing; design for manufacturing integration.

Introduction to computer aided process planning; selection of machine tools.

Recommended Books:

G.K. Lal, Vijay Gupta and N Venkat Reddy. ***Fundamental of Design and Manufacturing***. Narosa Publishing House, New Delhi

Surendra Kumar and M K Tiwari. ***Fundamentals of Design and Manufacturing***. IEI Study Material.

G Dieter, Engineering Design, McGraw-Hill International

G K Lal and S K Choudhary. ***Fundamentals of Manufacturing Processes***. Narosa Publishing House, New Delhi.

S K Vajpayee, ***Principles of Computer Integrated Manufacturing***. Prentice-Hall of India (P) Ltd., New Delhi